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(54) CHEWING GUM CONTAINING GLYCEROL MONO LAURATE.

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EP 0 387 330 B1

Des ript n

BACKGROUND OF THE INVENTION

The present invention relates to chewing gum compositions which help to prevent formation of and remove dental plaque. More particularly, the invention relates to gum compositions containing glycerol mono laurate, and methods of use of such compositions.

The role of dental plaque in the formation of caries is well known. Also, more recently the role of plaque in periodontal disease, resulting in tooth loss in older individuals, has been commented upon.

Attempts to reduce dental plaque through the use of chewing gum, and special compositions and ingredients for use in such gums, are also known. For example, U.S. Patent No. 4,400,372 describes a chewing gum designed to clean and polish teeth, containing non-toxic acid and calcined kaolin particles. U.S. Patent No. 4,568,537 describes a gum formulation which, when chewed, alters the oral environment to decrease tooth demineralization, and notes that chewing gum achieves same mechanical dental cleaning.

Chewing gum compositions may also contain ingredients which, either alone or in combination with other ingredients, have a anti-cariogenic effect because of the interaction of the ingredient and Steptococcus mutans, the primary microorganism in the mouth which forms acid by fermenting carbohydrates, the acid causing dental caries. For example, U.S. Patent Nos. 4,374,122 and 4,457,911 disclose that 3, 4-dihydro-6-methyl-1, 2, 3, -oxathiazine-4-one-2, 2-dioxide and hydrogenated starch hydrolysates, inhibit the growth of Steptococcus mutans.

Glycerol mono laurate has been identified as a food ingredient with anti-cariogenic activity. For example, an article in a symposium on the Pharmacological Effect of Lipids, The American Oil Chemists' Society (1978), describes experiments conducted by Kabara et al. with lauricidin brand glycerol mono laurate, both in vitro, and as a component of feed for rats in an in vivo test. U.S. Patent No. 4,067,997 to Kabara describes similar tests and various compositions containing glycerol mono laurate, including a surgical scrub and a mouthwash. In Patent Abstract of Japan, vol. 7, no. 118 (C-167) [1263] May 21, 1983 glycerol mono laurate is applied in a composition with sage and/or rosemary extract for oral cavity application, e.g. in a chewing gum. J. Dent. Res., vol. 63, no. 1, pp. 2-5, 1984 reports on the applicability and effectiveness of glycerol mono laurate with regard to the reduction of dental plaque.

SUMMARY OF THE INVENTION

Applicants have discovered that chewing gum compositions containing glycerol mono laurate have a dental plaque reducing affect, particularly where the gum also has a high filler and base content. The gum composition of the present invention is defined in claims 1-9. The preferred level of glycerol mono laurate is between about 0.25 and 0.75%. The gum composition also has a filler content at least 10% and also a high base content.

The invention also relates to the use of the above composition in the manufacture of a chewing gum for use in the reduction of dental plaque.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The gum composition of the present invention may be either chewing gum or bubble gum, both referred to herein as chewing gum. It is preferred that the gum base used be of a tack variety, to assist in the mechanical plague removal.

The gum composition of the present invention contains many ingredients found in conventional gum compositions, and at conventional levels. Gum base comprises more than 35% of the gum. It has been found, however, that a higher gum base content adds to the gum's cud size, and promotes plaque removal. Acceptable gum bases for use in the present invention include Paloja, Astro and Magna (bubble gum base), available from L. A. Dreyfus Co., Plainfield, New Jersey.

Fillers are common in gum compositions, and are often included with the polymer material in making up the gum base. For purpose of the present invention, any filler in the gum base and the filler added to make the final gum composition are added together in describing the filler content of the gum composition. The filler content is at least 10%, and more preferably between 15 and 50%. Preferred fillers include calcium carbonate, talc, sodium bicarbonate, dicalcium phosphate and mixtures thereof. The most preferred filler is calcium carbonate, at a level of about 22-24%.

The particle size of the filler should be between 0.1 µm (microns) and 25 µm (microns). The preferred particle size for a calcium carbonate filler is between about 0.5 - 10 µm (microns), with a mean particle size of 2.5 µm (microns).

The filler may be mixed with the base during base formulation, later during gum formulation, or a part added at each stage. It is preferred to mix the entire filler content into the base composition to alleviate the need for an extra ingredient at the gum mixing site.

Gum compositions of the present invention may include other ingredients normally found in

gum, including sweeteners, flavors, color, plasticizers, processing aides and the like. Because the gum is used in promoting dental health, it is preferred to use non-cariogenic sweeteners. A preferred sweetener is xylitol.

The level of glycerol mono laurate in the gum should be between 0.1 and 1.0%. Preferably, the level will be about 0.25 to about 0.75%. Most preferred are compositions with about 0.5% glycerol mono laurate.

The preferred gum composition of the present invention is as follows:

37.4% base
23.8% filler
15% xylitol
12.4% sorbitol
0.5% glycerol mono laurate
2.5% flavor
6% glycerine
0.3% aspartame
0.1% color

The glycerol mono laurate is believed to have several anti-plaque benefits in the gum composition of the present invention, as a surfactant, an antimicrobial agent and an anti-adherrant compound.

Preventing plaque buildup or removing plaque requires chewing the gum of the present invention containing glycerol mono laurate for at least 20 minutes, and preferably at least 30 minutes. Even one chewing has been found to produce detectable plaque reduction, but the preferred method of the invention involves repeated chewing of the gum, preferably five portions throughout the day for at least 20 minutes each, repeated for four successive days.

The gum composition of the present invention has been found to provide significant plaque removal, and hence the suppression of plaque buildup, when used in accordance of the method of the present invention.

It should be understood that the preferred embodiment described in detail herein is illustrative of various aspects of the invention, and that various modifications and changes to the presently preferred embodiment may be made.

Claims

1. A chewing gum composition comprising gum base, 5 to 80% bulking and sweetening agents, 1 to 10% glycerine, optional colour and flavour, and an amount of glycerol mono laurate, characterized in that the composition comprises 0.1 to 1.0% of glycerol mono laurate, more than 35% of gum base and at least 10% of filler.

2. A gum composition as claimed in Claim 1 wherein the composition includes 10 to 50% of an inorganic filler selected from calcium carbonate, talc, sodium bicarbonate, dicalcium phosphate and mixtures thereof.

3. A gum composition as claimed in Claim 1 wherein the composition comprises about 15% calcium carbonate.

4. A gum composition as claimed in Claim 1 wherein the gum composition comprises 22-24% calcium carbonate.

5. A gum composition as claimed in any one of Claims 1 to 4 wherein the glycerol mono laurate comprises 0.25 to 0.75% of the composition.

6. A gum composition as claimed in any one of Claims 1 to 4 wherein the glycerol mono laurate comprises about 0.25% of the composition.

7. A gum composition as claimed in any one of Claims 1 to 6 wherein the bulking and sweetening agent is selected from sorbitol, xylitol, sugar, corn syrup and mixtures thereof.

8. A gum composition as claimed in any one of claims 2 to 7 wherein the calcium carbonate has a particle size of between 0.1 and 25 μm (microns).

9. A gum composition as claimed in Claim 1 wherein the composition comprises about:
   (a) 38% gum base;
   (b) 15% xylitol;
   (c) 6% glycerine;
   (d) 24% calcium carbonate;
   (e) 12% sorbitol;
   (f) 2.5% flavour;
   (g) 0.1% color;
   (h) 0.3% aspartame; and
   (i) 0.5% glycerol mono laurate.

10. Use of a composition comprising 0.1 to 1.0% of glycerol mono laurate, more than 35% of gum base, 5 to 80% bulking and sweetening agents including at least 10% of filler, 1 to 10% glycerine, optional colour and flavour in the manufacture of a chewing gum for use in the reduction of dental plaque.

11. Use as claimed in Claim 10 wherein the chewing gum further comprises any of the additional features in Claims 2 to 9.

Pat ntansprüch

1. Kaugummizusammensetzung umfassend Gummibase, 5 bis 80% Bulkingmittel und Süßungsmittel, 1 bis 10% Glycerin, gegebenenfalls Farb- und Geschmacksstoff, und eine Menge an Glycerinmonolaurat, **dadurch gekennzeichnet**, daß die Zusammensetzung 0,1 bis 1,0% Glycerinmonolaurat, mehr als 35% Gummibase und mindestens 10% Füllstoff umfaßt.

2. Gummizusammensetzung nach Anspruch 1, worin die Zusammensetzung 10 bis 50% eines anorganischen Füllstoffs, ausgewählt aus Calciumcarbonat, Talk, Natriumbicarbonat, Dicalciumphosphat und Gemischen davon einschließt.

3. Gummizusammensetzung nach Anspruch 1, worin die Zusammensetzung etwa 15% Calciumcarbonat umfaßt.

4. Gummizusammensetzung nach Anspruch 1, worin die Gummizusammensetzung 22-24% Calciumcarbonat umfaßt.

5. Gummizusammensetzung nach einem der Ansprüche 1 bis 4, worin das Glycerinmonolaurat 0,25 bis 0,75% der Zusammensetzung umfaßt.

6. Gummizusammensetzung nach einem der Ansprüche 1 bis 4, worin das Glycerinmonolaurat etwa 0,25% der Zusammensetzung umfaßt.

7. Gummizusammensetzung nach einem der Ansprüche 1 bis 6, worin das Bulkingmittel und Süßungsmittel ausgewählt ist aus Sorbit, Xylit, Zucker, Maissirup und Gemischen davon.

8. Gummizusammensetzung nach einem der Ansprüche 2 bis 7, worin das Calciumcarbonat eine Partikelgröße zwischen 0,1 und 25 µm hat.

9. Gummizusammensetzung nach Anspruch 1, worin die Zusammensetzung umfaßt etwa:
   (a) 38% Gummibase;
   (b) 15% Xylit;
   (c) 6% Glycerin;
   (d) 24% Calciumcarbonat;
   (e) 12% Sorbit;
   (f) 2,5% Geschmacksstoff;
   (g) 0,1% Farbstoff;
   (h) 0,3% Aspartame; und
   (i) 0,5% Glycerinmonolaurat.

10. Verwendung einer Zusammensetzung, umfassend 0,1 bis 1,0% Glycerinmonolaurat, mehr als 35% Gummibase, 5 bis 80% Bulkingmittel und Süßungsmittel, einschließlich von mindestens 10% Füllstoff, 1 bis 10% Glycerin, gegebenenfalls Farbstoff und Geschmacksstoff, bei der Herstellung eines Kaugummis zur Verwendung bei der Verminderung von Zahnbelag.

11. Verwendung nach Anspruch 10, worin der Kaugummi ferner irgendeines der zusätzlichen Merkmale in den Ansprüchen 2 bis 9 umfaßt.

Revendications

1. Composition de chewing-gum (gomme à mâcher) comprenant de la base de gomme, 5 à 80 % d'agents donnant du corps et/ou du volume et édulcorant(s), 1 à 10% de glycérol, éventuellement du colorant et de l'agent d'aromatisation ou de flaveur, et une certaine quantité de monolaurate de glycérol, composition caractérisée en ce qu'elle comprend 0,1 à 1,0 % de monolaurate de glycérol, plus de 35 % de base de gomme et au moins 10 % de charge.

2. Composition de gomme telle que revendiquée à la revendication 1, dans laquelle la composition comprend 10 à 50 % d'une charge minérale choisie parmi le carbonate de calcium, le talc, le bicarbonate de sodium, le phosphate dicalcique et leurs mélanges.

3. Composition de gomme telle que revendiquée à la revendication 1, cette composition comprenant environ 15 % de carbonate de calcium.

4. Composition de gomme telle que revendiquée à la revendication 1, cette composition de gomme comprenant 22 à 24 % de carbonate de calcium.

5. Composition de gomme telle que revendiquée dans l'une quelconque des revendications 1 à 4, dans laquelle le monolaurate de glycérol représente 0,25 à 0,75 % de la composition.

6. Composition de gomme telle que revendiquée dans l'une quelconque des revendications 1 à 4, dans laquelle le monolaurate de glycérol représente environ 0,25 % de la composition.

7. Composition de gomme telle que revendiquée dans l'une quelconque des revendications 1 à 6, dans laquelle l'agent donnant du corps et du volume et édulcorant est choisi parmi du sorbitol, du xylitol, du sucre, du sirop de maïs et leurs mélanges.

8. Composition de gomme tell que revendiquée dans l'une quelconqu des revendications 2 à 7, dans laquelle le carbonate de calcium a une taille particulaire comprise entre 0,1 et 25 µm.

9. Composition de gomme telle que revendiquée à la revendication 1, cette composition comprenant environ :
   (a) 38 % de base de gomme ;
   (b) 15 % de xylitol ;
   (c) 6 % de glycérol ;
   (d) 24 % de carbonate de calcium ;
   (e) 12 % de sorbitol ;
   (f) 2,5 % d'agent d'aromatisation ou de flaveur ;
   (g) 0,1 % de colorant ;
   (h) 0,3 % d'aspartame ; et
   (i) 0,5 % de monolaurate de glycérol.

10. Utilisation d'une composition comprenant 0,1 à 1,0 % de monolaurate de glycérol, plus de 35 % de base de gomme, 5 à 80 % d'agents donnant du corps et du volume et édulcorant-(s) et comprenant au moins 10 % de charge, 1 à 10 % de glycérol, éventuellement du colorant et de l'agent d'aromatisation et de flaveur, dans la fabrication d'un chewing-gum destiné à servir à la réduction de la plaque dentaire.

11. Utilisation telle que revendiquée à la revendication 10, dans laquelle le chewing-gum comprend en outre n'importe laquelle des particularités supplémentaires énoncées aux revendications 2 à 9.